5°) $P = \frac{RI_m^2}{2}$

a- $P = \frac{hV_m^2}{2} = 0,5\frac{(2,47)^2}{2} = 1,52\text{watt}$

b- $P = \frac{hV_m^2}{2}$

P est max $\rightarrow$ V_n est max $\Rightarrow$ résonance de vitesse

$\Rightarrow \omega = \omega_0 = 30\text{rad.s}^{-1}$

$V_m = 9\text{ms}^{-1}$

$P_0 = \frac{0,5(9)^2}{2} = 20,25\text{watt}$

$W = P_0\Delta t \quad / \quad \Delta t = T_0 = \frac{2\pi}{\omega_0}$

$W = 20,25\frac{2\pi}{30} = 4,4\text{J}$

Exercice N°2 :

1°)

a- $0 < \varphi_F - \varphi_x < \pi$

F est toujours en avance % à x(t)

$F_{(1)} \rightarrow$ courbe (2)

x(t) $\rightarrow$ courbe (1)

b- $\omega_1 = \frac{2\pi}{T} = \frac{2\pi}{6x\frac{0,2}{3}} = 5\pi\text{ rad s}^{-1} = 15,7\text{ rad s}^{-1}$

c- $\Delta t = \frac{T}{12}$

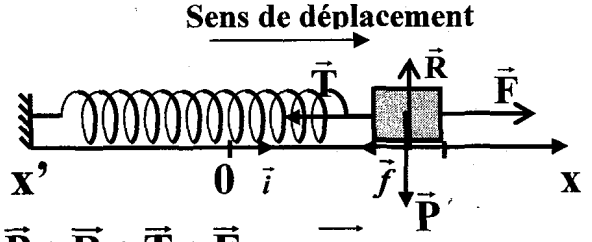
$|\Delta\varphi| = \Delta t.\omega = \frac{2\pi}{T} = \frac{T}{12} = \frac{\pi}{6}$ or $\Delta\varphi > 0$

$\Rightarrow \varphi_F - \varphi_x = \frac{\pi}{6}$

d- $x(t) = 6.10^{-2}\sin(5\pi t)$ (en m)

$F(t) = 1,17.\sin\left(5\pi t + \frac{\pi}{6}\right)$ (en N)

2°)



RFD $\vec{P} + \vec{R} + \vec{T} + \vec{F} = m\vec{a}$

Proj : $T + f + F = ma \Rightarrow -kx - hv + F = ma$

$\Rightarrow ma + hv + kx = F \Rightarrow m\frac{d^2x}{dt^2} + h\frac{dx}{dt} + kx = F$

3°)

a- Pour $\omega = \omega_1 = 5\pi\text{rad.s}^{-1}$

$\varphi_F - \varphi_x = \frac{\pi}{6}$